Business Rules, Decisions and Processes: Five Reflections upon Living Apart Together

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Abstract

Information Systems must provide flexible support for business processes, which should be compliant to the (intra-organizational) business policies and procedures, to regulations and to imposed protocols. Some separation of concerns, i.e. making the imposed constraints explicit, has been observed in order to comply with this dual objective of flexibility and compliance. In this paper, a list of five reflections is used to examine the coexistence and the relationship between business rules, decisions and processes. These considerations will be useful when evaluating how to become less dependent on rigid process models containing large parts of business and decision logic.

Keywords: Business Processes, Business Rules, Business Decisions

Introduction

Contemporary socio-economic factors – i.e. globalization, mergers and acquisitions – have resulted in a need for standardizing and streamlining business operations. On the other hand, businesses are increasingly facing demands for custom services and flexibility.

Designing information systems that provide support for operational business processes with the right level of process flexibility, compliance, efficiency and effectiveness can be a challenging task [1,2]. This position paper describes five reflections on the coexistence between business rules and processes in order to obtain the aforementioned qualities. Each of the reflections shows a different focus in the business process management research, in increasing order of involvement, which results in differences in the extent to which the desirable characteristics are present in the resulting business process model.

The five reflections can be used as discussion points when deciding to what extent the business logic (rules, decisions) can or should be separated from the business process. Furthermore, different types can be combined and therefore deliver the desired fit in different situations throughout the lifecycle of the business environment.

This paper is structured as follows: in the next section the five reflections, which deal with various forms of business logic modeling, are elaborated. A conclusion summarizes the body of the document and provides some afterthoughts.

An overview of reflections on rules, decision and processes

Reflection 1: Too detailed decision paths clutter the process: Keep it simple

A first point of reflection relates to the intertwining nature of processes and decisions. A process model should not be the direct mapping of a decision tree (as in Figure 1), as multiple cascaded decision diamonds could be merged into one overall decision point (when age > 18 and medical record is clean, accept the client, otherwise decline). Otherwise the business logic takes away the focus from the real process tasks. Of course the example is trivial, but it illustrates how some processes overemphasize decision paths.

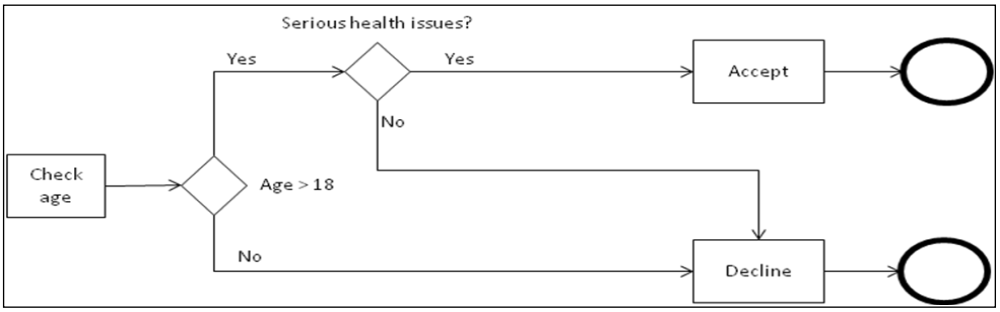

Figure 1: Process model with cascaded decision diamonds

Reflection 2: Hardcoding the rules may become inflexible. Keep them apart

This second reflection entails a fully-fledged co-existence between business processes and decision rules. Universal stable sequential aspects of the operations are being specified in imperative flow models, whereas decisions rules are deliberately withdrawn from the flow specification. Separating these business rules, such as calculations or preconditions, enables them to evolve independently and consequently results in higher levels of operational flexibility [2]. Research has indicated the potentially high volatility of business strategies requiring adequate changes in the business rules leading to a decision, such as calculation rules or preconditions. As a result this co-existence may better cope with the flexibility required by the idiosyncrasies that contemporary organizations face. Of course this seems to hide some of the detailed execution paths or introduces variation, and therefore seems to take away the comfort of nicely drawn execution paths.

Figure 2 revisits part of the example from the previous reflection. A change in the rules will no longer impose immediate changes to the flow logic and therefore creates an agile and maintainable environment. Separating rules and decisions from the process simplifies the process model (i.e. separation of concerns).

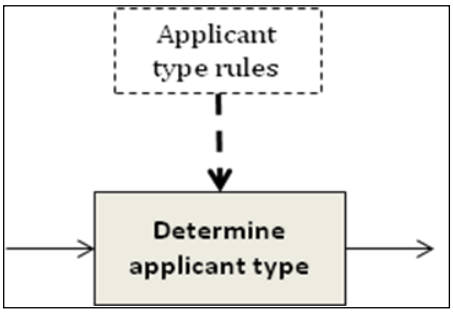

Figure 2: Offloading the process

Reflection 3: Modeling Decisions/Rules is a separate modeling task

Over the years, numerous notations and frameworks have been proposed to formalize rules and decisions. Techniques such as decisions requirements analysis [6] have proven to be able to more clearly separate decisions, business knowledge such as rules and decision tables, and knowledge sources. The approach takes the business owner(s) through various stages to efficiently identify the decision points and their inputs (business knowledge and data) and offers a comprehensive view of the process(es) that will support the obtained decision model.

Decisions are typically based upon a number of business (decision) rules that describe the premises and possible outcomes of a specific situation. Since these decisions guide the activities and workflows of all process stakeholders (participants, owners), they should be regarded as first-class citizens in business process management. Sometimes, the entire decision can be included as a decision activity or as a service (a decision service). Typical decisions of this kind are: creditworthiness of the customer in a financial process, claim acceptance in an insurance process, eligibility decision in social security, etc.

Recently, extensions within the range of business knowledge representation frameworks have been provided. These include the forthcoming OMG Decision Modeling & Notation (DMN) standard, which will represent decision requirements and different decision logic representations such as decision tables. These tables are an excellent tool for business users to model their decisions and provide an intuitive interface for representing business knowledge.

Note that the setup of this reflection is the further extraction of business logic from the overall process. Where the previous approach only modeled the separate decision points, this reflection considers a level of separation which aims to make the business knowledge separate and reusable across the process(es). The model of the decision (e.g. in complex legal documents) can be modeled separately and this knowledge can be used at the appropriate places in the process.

Reflection 4: Sometimes the entire process is basically the execution of a complex decision: there may be multiple ways to 'process' a decision

Before we install or reengineer a process for a complex decision, it might be good practice to study the decision and data requirements. Depending on the decision logic, we could (automatically?) design an optimal process where optimality is defined in terms of process criteria.

An example of this approach is described in [3]. It introduces models illustrating the relationships between decisions, and provides ways to derive business processes to facilitate corresponding decision making. This approach will increase the flexibility, traceability and maintainability of the underlying decision making processes, while at the same time, minimizing the impact from changes caused by modification of specific decision logic. Business decision management should have clearly stated goals during the entire process of eliciting, analyzing, defining, tracking, evaluating, and documenting business decisions. [8] defines five criteria to ensure better decision yield – that is, the impact of decisions on business results: precision, cost, speed, agility and consistency. Moreover, the transformation patterns allow for added operational agility when the characteristics (e.g. time and cost) for obtaining lower level elements change.

Reflection 5: Rule-driven, declarative or Intelligent BPM

Whereas the first reflection explicitly deals with a far reaching sequential structuring of the business operations, the focus in this fifth reflection shifts to expressing the business rules. Attention is put on capturing regulatory and internal directives in rules of different forms (e.g. event conditions and logical expressions). With a minimum specification of the relevant business concerns, maximal allowable freedom is left for letting the exact activity sequence of a process instance grow organically [5]. Moreover, business operations that are modeled according to these principles have the advantage that compliance with internal and external directives can be easily demonstrated. Several business process research subdomains are compromised in this reflection, including declarative business process management [9], ad-hoc business processes [14] and adaptive case management [15].

Business processes that are characterized by a dynamic, human-centric and non-standardized setting, will benefit from the flexibility that could potentially be provided by declarative process modeling (e.g. healthcare processes while general medical principles are the same for all patient, each case will be different due to complications, patient conditions, etc.).

Conclusion

This paper provides an overview of five important reflections relating to the coexistence of business decisions, rules and processes. These considerations could be useful when evaluating how to become less dependent on rigid process models containing large parts of business logic. The construction of more comprehensible and agile outcomes is facilitated by using the appropriate distinct models.

Future research will focus on the development of mechanisms for the integration of business processes,

decisions and rules. We currently examine how business rules can be translated into a uniform event mechanism, such that the event handling could provide an integrated enforcement of business rules of many kinds (including data rules, process rules, timing rules and authorization rules). The creation of a tool that supports the transformation of business constraints specified in an extended process rule enabled version of SBVR (Semantics of Business Vocabulary and Business Rules) into Event-Condition-Action rules, enables the creation of a non-overly restrictive execution model that is compliant with the imposed directives. Moreover, the mechanism could significantly simplify a compliance assessment.

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